

Name Key
 Period _____ Date 4/17/15

Chemistry I: Gas Laws Practice Test A

Answer the following problems by **showing ALL work!** (15 pts each)

1. 700.0 mL of oxygen are collected over water at 26.0 °C and a pressure of 760.0 mm of mercury. What is the volume of dry oxygen at 32.0 °C and 500.0 mm pressure?

$$760.0$$

$$- 25.3$$

$$\hline 734.8$$

$$P_1 = 734.8 \text{ mmHg} \quad P_2 = 500.0 \text{ mmHg}$$

$$V_1 = 700 \text{ mL} \quad V_2 = X$$

$$T_1 = 299 \text{ K} \quad T_2 = 305 \text{ K}$$

$$(734.8)(700) = \frac{500(X)}{299}$$

$$X = 1049.4 \text{ mL}$$

2. What is the final volume of a 250.0 mL gas sample that is subjected to a temperature change from 22.0 °C to 30.0 °C and a pressure change from 760.0 mmHg to 560.0 mmHg?

$$P_1 = 760 \text{ mmHg} \quad P_2 = 560 \text{ mmHg}$$

$$V_1 = 250 \text{ mL} \quad V_2 = X$$

$$T_1 = 295 \text{ K} \quad T_2 = 303 \text{ K}$$

$$(760)(250) = \frac{560(X)}{303}$$

$$X = 330.3 \text{ mL}$$

3. At a pressure of 600.0 mmHg and 24 °C, a certain gas has a volume of 350.0 mL. What will be the volume of this gas under STP?

$$P_1 = 600 \text{ mmHg} \quad P_2 = 760 \text{ mmHg}$$

$$V_1 = 350 \text{ mL} \quad V_2 = X$$

$$T_1 = 297 \text{ K} \quad T_2 = 273 \text{ K}$$

$$(600)(350) = \frac{760(X)}{273}$$

$$X = 253.9 \text{ mL}$$

4. How many moles of gas are contained in 750.0 mL at 21.0 °C and 735.0 mm Hg pressure?

$$P = 735 \text{ mmHg}$$

$$V = 750 \text{ mL}$$

$$T = 294 \text{ K} \quad n = X$$

$$(735)(750) = X (62360) 294$$

$$X = .03 \text{ mole}$$

5. Calculate the molecular weight of a gas if 35.44 g of the gas stored in a 7.50 L tank exerts a pressure of 60.0 atm at a constant temperature of 35.5 °C.

$$(60)(7.50) = \frac{(35.44)(.082)(308.3)}{X}$$

$$X = 1.99 \text{ g/mol}$$

$$X = 2 \text{ g/mol}$$